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Information Management and Disaster Archives

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Abstract

Information management is a discipline which gives opportunity the collection of every kind of explicit or tacit information reresource appearing in the result of past activities and experience, sharing it by passing through suitable processes and achieving useful results from them. Disaster is a fact that affects both individual and social lives in negative ways. In order to mitigate these effects the concept of disaster management provides many opportunities. As a result of these processes there are lots of records and information about disaster experiences of communities and to get effective and sustainable disaster management these records and information have to be managed according to the information management approach. In this paper, the role of disaster information centers and systems, in the context of Turkey and the world are evaluated the disaster management, is examined and the status of disaster information centers in both.

Keywords: Disaster Information Center, Disaster Informatics System, Disaster Archive, Disaster Management

Introduction

Information management is a management model which effectively manages experience, thoughts, trends and applications in the lives of individuals, institution and society and creates a new synergy by presenting every kind of information reresource in usage. Information management, which has come to the fore with its roles in the development of organizations until today, is also a management device

which can be utilized for solving social problems. Data about every kind of event occurred in social life are important values which can be used in order to found more healthy societies in the future.

Disasters are events which cause violent dangers in a society to pause all or a part of the main functions of social structure (Fritz, 1961). As stated in the description, disaster is a social event and it should be controlled with particular planning. Disaster planning is activities which are needed to do with the aim of providing harms of the disaster to remain in the lowest level in all dimensions of society and preserving every kind of reresource in the best conditions. Information management approach and information banks that are placed as if one of the main elements of this approach, take place among the important components that should be taken into consideration in disaster management. In most of the societies, where disaster data are not collected or usefully utilized, similar events are re-experienced and there can be greater losses. Disaster risk can be avoided by firstly managing, sharing and transforming them into precautions for future disasters and the individual and social experiences which should be recorded in a specific system. In other words, the basis of an effective disaster management is formed with a recording of every kind of local, regional and national disaster and sharing every kind of data about disasters and disaster projects with necessary institutions.

Disaster Management

Natural and artificial events and the results of them, affecting society by causing physical, economical and social losses and stopping or pausing normal life and human activities, are known as disasters. In order to evaluate an event as a disaster, it is necessary for the event to cause loss in the society, residential areas and affect a region completely or partly by damaging or pausing the human activities (Tudor, 1997:4). The common characteristic of the descriptions of a disaster is the occurring of a physical, social and psychological ruin and loss which could not be overcome for a long time.

In most of the studies and projects carried on, disaster is classified into two groups as natural and artificial. Natural disasters are events occurring suddenly or in a particular time and damaging the course of general life such as production, infrastructure, transportation and communication. Artificial disasters, which are also called technological disasters as conceptual, are damaging events created by the modern social life style on natural order. Division of disasters into types is necessary for the studies which will be carried on this field. However, always drawing a definite line between natural and artificial disaster is impossible. For example, the melting of glaciers is gaining speed due to the emission of gas into the atmosphere. Although this event seems to be a natural disaster, its resource is dependent on human life. Similarly, disasters types may become varied or change over time. For example,

drought, which has increased because of global warming, has become the most discussed matter among the disaster studies in recent years.

Disaster management means managing all social institutions, associations and resources in order to coordinate the works needed to be done before, during and after the disasters with the aim of preventing disaster and reducing their harms. In other words, disaster management is a management approach and specialization field which determines and applies technical, managerial and legal studies which should be done before, during and after disasters in order to prevent the disasters and reduce their harms. (Akdağ, 2002: 5-6). Disaster management reflects using all resources as a body and as coordinated in contending with disaster. Consequently, disaster management is a discipline in which many different disciplines are operated as coordinated. For this reason, disaster management is a wide application area which necessitates the managing of private, legal and public resources for a specific purpose. One of the important corner stones of disasters management is disaster database and archives. Each activity executed before, during and after the disaster would result in information and document production, sharing these resources among disaster responsible people and participators in a complete, correct and profitable way can be possible with managing every kind of disasters data in a system integrity. In order to see what kind of information and document will be preserved in disaster archive systems, it is necessary to look at disaster management and the general purposes wanted to be reached. According to this, purposes of disaster management can be listed as following:

Before the disaster,

— Putting forward the disaster risk probability.
— Forming an inventory of potential resources such as human, budget and equipment which can be utilized against the disaster.
— Making proportional analyses between conjectural risk and potential resources.
— Taking necessary technical, managerial and legal precautions for saving the society with minimum harm and physical losses in the result of analyses.
— Making preparations for rescue, first aid and rehabilitation.
— Preparing educational programmes to the public in order to gain required information to mitigate negative effects of disastrous events.

During the disaster,

— Determining necessary interference precautions.
— Making decisions for removing risk that cause loss of life and property.

After the disaster,

- Making life and property protecting arrangements against second dangers and risks that the disaster may cause.
- Making plans for meeting urgent needs of disaster victims as soon as possible with the most fluent methods.
- Making regulations which can remove economical, social and psychological problems caused by disaster as soon as possible.
- Working for making the life in a disaster region normal.

Looking at the disaster management purposes above, it is seen that disaster works have caused a huge information resource. Important and huge information production have made even in works done for only reducing risks. For example disasters risks, precautions preventing risks, potential resources which can be utilized against risks and address information are some of them. Similarly, communication records made during disaster coordination are also among the important data that are produced in disaster applications and should be recorded in archive systems.

Today, disasters are observed and managed by using technology such as early warning systems, damage guessing systems, geographic information systems, disaster coordination systems and various event monitoring systems. Mentioned systems, may have different characteristics according to the type of technology which is used. Of course, document produced in these systems may also have different types and characteristics. For example, numerical photographs, video records, graphics, measurement analyses, sound records, maps and texts are documents which are produced in different type and characteristics. This variety observed in the kind of document and data structure hinders integration of disaster informatics systems and the forming of a disaster archive. In order to solve this problem determining and practicing some standards are obligatory. This obligation is also necessary for providing the usage of available information resources in the future. For this reason, the disaster informatics systems used today should also be evaluated according to the type of information resource they produce and arranging methods.

Information Management

Information management is the approach that is dependent on the basics of revealing and sharing every kind of information resource in individual and institutional level. Basic resources of information management are data and information. In other words, information management is a discipline consisting of,

-- the smallest corner stone of information datum,

-- tacit information which cannot be presented to usage consciously or unconsciously and

-- all explicit, recorded, retrieval and sharable information (Geyik and Barca, 2004:431; Özer, Yücel and Seyrek, 2003;3–4). In order to express the characteristics and purposes of the information management in a better way, concentrating on ***data***,

information and ***knowledge*** phenomena and concepts of upper knowledge or ability, which is evaluated over knowledge, is necessary.

Data are raw facts or impressions represented by various symbols, letters numbers and sings. Information is the raw resource form transformed after being classified with various data statistical techniques. For example, data are transformed into information by classifying, summarizing or reporting. There is no intellectual effort in the process of the transformation of data into information. For this reason, it is possible to define information as row resources, taking place within the ordered and purposeful groups between data and knowledge, which are needed for the production of information (Prytherch, 2000:370). Knowledge is upper information which comes into existence from information, personal information accumulation and experience. Aktan and Vural (2005:4) define knowledge as a kind of commented information taking place between rawer information types such as data and information and more complex and processes ones such as understanding-idea-wisdom.

Although a clear separation cannot be made between information and knowledge, it is seen that there are various types shown above knowledge in the literature of this field. These are generally tried to be explained with concepts such as ability, wisdom, idea, intelligence, upper knowledge or specialization. Aktan and Vural (2005:4) define the last information type on the topmost of information pyramid as “experience” which is useful for differentiating true and false in social events (Figure 1). In this event, some persons think that making appropriate decisions in the stages of understanding and comprehension of social events and reasoning are directly proportional to processing of information in a systematic way and reshaping it with observations and experience.

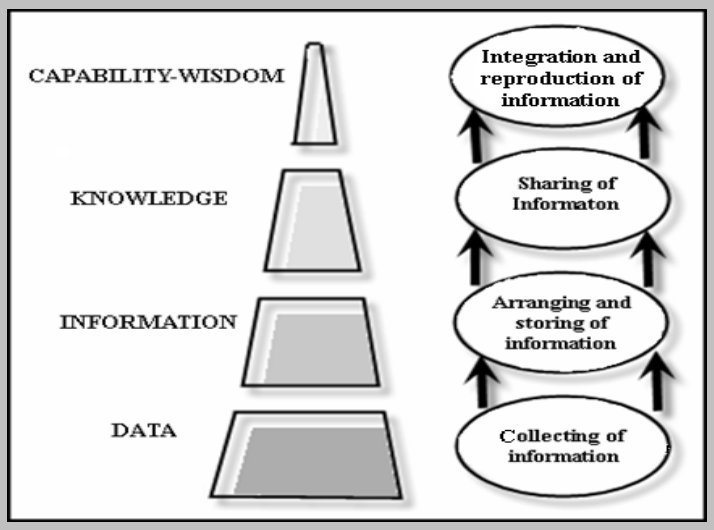

Figure 1: Organizational Information Resources and Process of Information Management

Information is also divided into types according to the availability level in information management discipline. Information is generally evaluated in two groups as explicit and tacit (Figure 2). Explicit information is information which is not secret, forbidden or limited and it can be easily reached for producing new ones and adding new values to activities. Tacit information can be found in two types as both recorded and also unrecorded. Recorded tacit information is information which is recorded on any kind of information recording devices; however, they cannot be reached and utilized since they have secret, forbidden any limited usage right. Unrecorded tacit information is information which is hard for others to utilize since it is in the individuals' minds. This kind of information both comes out accidentally and it is also revealed consciously by means of a particular system. Unrecorded tacit information consists of information that the individual has without adding a meaning to any phenomenon. Individual knowledge is idea that the individual develops by adding new information and meanings to information.

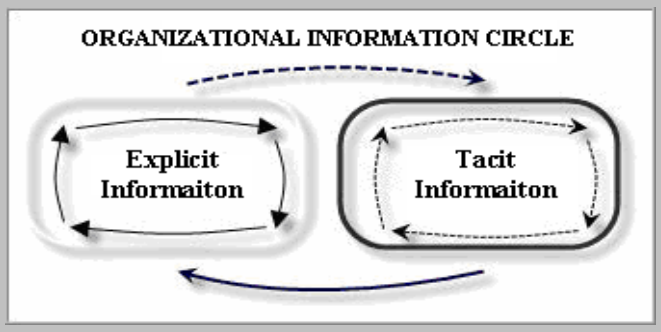

Figure 2: Information Circle

The purpose wanted to be reached with information management is transforming tacit information into explicit information. The most important target of information management is providing every kind of available important resource to pass through the information management filter regardless of its type, the place it is recorded and with which aim it is produced. Mentioned filter executes separating valuable information from worthless information, delivering information according to personnel portfolios and evaluation pool. The most important purpose of information management is revealing every kind of potential information in the institution, providing easiness of usage and access, and producing new information with the ones taken from the environment. Therefore, the most important factor in information management approach's successful results is the support of the manager and self-sacrifice of the workers.

In national disaster management and disaster informatics system, data about experienced disasters and all personnel and institutional experiences on disasters, beside information and knowledge, should be included. Therefore, it is obligatory to design a disaster informatics system according to the information management philosophy. Disaster informatics systems are systems in which basic components of

disasters management like personal, budget equipment, communication and information are managed. The disaster archive system is one of the most important components of disaster informatics systems and mostly it cannot be parted from disaster informatics systems. Especially, the disaster informatics systems which process with real-timed data flow also make archiving function. For this reason, evaluating disaster informatics systems apart from an archive systems do not give correct results. Disaster archive systems are disaster coordination systems where every kind of information about experienced disasters are recorded and presented to the usage of concerned persons and institutions in the national, institutional or local level. Identities of every kind of disasters and details of them are recorded in disaster archive systems. Disaster archive systems are a comprehensive platform where every kind of document such as document, film, project, report produced as printed or electronic about disaster events or studies are preserved, and bibliographical data of these documents are preserved in optic and or magnetic recording places. Although disaster archive systems are designed as a production of informatics applications, the phenomenon that causes this design is the necessity of information, in design of the mentioned systems, information management theory should be accepted as criterion. The system should also be executed according to this theory.

Information Centers in Disaster Planning and Disaster Archive Systems

Interfering in disasters in an adequate, ordered, right and determined way can be possible with having every kind of information about the place where the disaster was experienced. Receiving inadequate information about the type and size of the disaster, sending inadequate equipment, rescue teams to the disaster region, not being able to make comparative analyses about the past disaster, are caused by not being able to form a central disaster informatics and archive systems providing real-timed data. Undoubtedly, each country has a different institutional structure and working process in disaster works. It is obligatory to carry on all kinds of disaster plannings and programmes under the management of a central organization which particularly should be national disaster institution in order to prevent disrupting of national and international cooperation because of differences mentioned before.

National disaster institutions serve as a coordination base of disaster works carried on by other institutions. This situation is same for the disaster information centers. Information centers formed with the names of the archive, documentation or library by other institutions should work in coordination with the information center which is founded in the national disaster institution. National disaster information center should fulfill in determining and applying the minimum common characteristics duties which are needed to be had by other disaster information centers. Furthermore national disaster information centers should carry on works aiming to provide each database and archive system founded for this purpose with similar characteristics.

It is necessary for disaster informatics and archive systems to exchange data with other systems in order to have common minimum standards.As in the other electronic applications in the e-government model, they should also be compatible with common minimum standards. Being open to be shared and reliable of disaster informatics and archive system are characteristics that can only be provided by being compatible with general standards adopted as principles in e-government applications. Therefore, disaster informatics and archive systems,

- should have characteristics that they can share disaster information and documents which have no special security limitations with any person and institution as real-timed,
- should provide coordination between information users and managers,
- should provide easiness and openness for the relationships of people and institutions in local, regional, national and international levels regardless of being private or public,
- Should have a structure that will present an integral perception to the ones working with disaster planning.

Norms and standards expose the method providing compatibility between differences. Integrality in disaster informatics and archive systems displays parallelism with the standards which make working of the systems together possible. These standards also cause action slackness in the systems. Minimum standards which should be found in the mentioned systems can be listed as following:

- Metadata,
- Index of subject headings,
- Common data models and files,
- Presentation and retrieval standards.

Metadata is structured description of information which reveals the identity of any kind of information resource, shows where it is recorded, makes its retrieval possible and provides controlling for a long time. There are generally both of the printed and electronic resources in disaster information centers. Disaster informatics and archive systems can present both of the two resource types in an interconnected way in the same structure. For example, in information centers and the informatics systems used in these centers, various resources such as archive documents, indexes, books and other printed publications in addition to html files, web sites, digital photographs and databases can be preserved. Metadata is the qualification language used in defining and cataloguing every kind of information resource. As a result of this, metadata consists of all devices which are used in order to reach the resources whose catalogues are prepared by means of standard definition tips. Catalogue researches are made with retrieval tips defined in metadata.

Metadata is identity which exposes the context, content and structure of document. In other words, metadata is explaining and regulating data which makes controlling, managing, researching, storing and understanding the documents possible for users for a long time. For example, metadata both consists of information about working process such as production, management and storing of documents in many subjects like the heading, type, production date, operation process and also make accessing these documents technically possible (Guidelines, 2001).

Metadata is defining language which has been widely used in identifying every kind of information resource with a similar defining pattern. However, subject headings indexes are needed for characterizing similar typed documents on metadata set with the same name. For example, first, terminology unity should be achieved in many subjects such as the types and definitions of all natural disasters, emergency codes, disaster units, risk and disaster categories. Then, a disaster terms index should be formed in a way that will expose the contacts among them. In order to define same kind of documents with similar terminology, this index should be applied in every disaster system. Disaster concepts index is necessary for forming language unity in disaster works and providing retrieval of resources.

Record, presentation and change of information take place among the important functions of disaster informatics functions. Data and file structures should be provided to become parallel to the standards used in e-government applications. The criteria needed to be taken into consideration in determining standards are reducing the necessity of additional software to a minimum level and being dependent on open standards as possible and being open to access of different platforms of preferences. For example, the most suitable standards, which takes place among a compressed file, word process document, presentation document, picture file, electronic table document, animation, real-timed and band recorded sound and video, should be determined for disaster informatics and archive systems. Apart from this, standards should be put in subjects such as internet, e-mail, file transfer, local network/ wide area network access and network security.

The difficulties in electronic data share are one of the most important problems faced in e-government applications. However, if increasing productivity in state life and presenting public service in a more effective way are possible with the sharing of information resources, producing these resources must be produced on sharable data structures, which are accepted as universal criterion. XML (Extensible Markup Language) is the most important sharable data structure which is accepted internationally and widely used in most e-government applications. Taking consideration of data and file type varieties produced in disaster informatics systems, it will not be a wrong evaluation to say that XML is the most suitable data model for disaster informatics systems and archives. Because, XML is a plain and flexible shaping language that is independent from hardware and operating systems (Digital, 2004:63-64).

Disaster informatics and archive systems should have a free structure which the citizens and institutions, who want to contribute to the disaster works voluntarily and have information about the works, can follow the activities executed in this field. For this reason, mentioned systems should be designed as information centers where people can receive information about avoiding risks and challenging with facts of disaster. The mentioned systems with this feature will have a characteristic being education platform increasing the conscious level of the society in disaster matter.

Late interfering or interfering with the disaster by using wrong methods are the frequent problems of today. A part of these problems stems from not being able to utilize the experience and information accumulation adequately. Totalitarian disaster informatics and archive system should fulfill the duty of sharing past experience among all shareholders of disaster management in the risk reducing and disaster avoiding processes. For this reason, in the mentioned systems an information sharing module should be formed for the managers to transfer their experience to others. This module makes carrying the disaster works in the frame of information management approach possible.

Disaster Informatics System in the World

Considering the projects carried on disaster management, it is seen that there are important enterprises on disaster informatics systems in the whole world, first of all in the developed countries. In recent years, important disaster information centers and disaster databases have been formed in most places in the world. Seeing the studies carried on this field, it can be said that disaster informatics systems have been developing as parallel to e-government applications. Moreover, an important part of the mentioned systems are formed with the aim of meeting the needs of only a specific discipline. In most of the project reports carried on this field, there are also decisions which suppose necessary of uniting every kind of disaster databases and archives, which have been formed until today, on a platform. In order to show the quality of the disaster informatics systems used today, it is necessary to study the systems developed by some institutions which are frequently mentioned in the field of disaster management in the world.

In an announcement The Federal Emergency Management Agency (FEMA) made in 2007, it is stated that a real-timed information share system is needed in order to provide coordination among the institutions in disaster management and this system will be founded in a short time. In FEMA's announcement, it is also stated that the name of this system, which will store national information only in one place, will be Emergency Management Information Management System (EMIMS). EMIMS will play the role of being a coordination center where all institutions can share information during a national crisis. EMIMS will be designed as real-timed automation system which supports national emergency management. The most

important characteristic of EMIMS is that it will have automatic process and recording technique in e-government applications and transform the files it takes from the other systems into wide standards (Chan, 2007).

National Incident Management System (NIMS) used by the United States Department of Homeland Security is a system having most of the standards which are compatible with the inter-institutional system integration. However, disaster managing and disaster archive forming are not prior purposes in this system. NIMS was mostly founded for the purpose of security events' coordination. In order to provide cooperation and coordination among the regional and local management units, some similar systems will be integrated in a short time. Inter institutional cooperation systems, education systems, resource administration and management systems, informatics systems which collect, follow and report details of events are some of them. Also studies have been carried on in order to get NIMS and other systems have similar concepts, principles, terminology and technology (US Department, 2004:1-2).

In Japan, the National Research Institute for Earth Science and Disaster Prevention (NIED), have carried on some projects on disaster studies and various systems have been formed in the result of these projects. For example, in NIED many disaster independent systems have been developed such as High-sensitivity Seismograph Network (Hi-Net), Landslide Disaster Prediction Support System (Lapsus), Typhoon Database System (NIED-DTD), Landslide Map Database, Japan Seismic Hazard Information Station (J-SHIS). The mentioned systems provide information in various subjects such as reducing, measuring and analyzing of natural and artificial disasters' risks. However, these systems have not been united as a body yet although they were developed in the same institute (National, 2007).

The situation observed in Australian disaster informatics systems and databases is not different from the other countries. The studies carried on the matters of determining, analyzing, announcing and preserving the experienced disasters are executed by different organizations and independent systems. For example, collecting, arranging and presenting of disaster resources to service of the experienced disasters in country are carried on the portal named Australian Disaster Information Network (AusDIN) of Australian Emergency Management Committee. However, in this portal, there has not been any disaster data yet and the service of real-timed information share has not been presented (Australian…, 2007). The Emergency Management Spatial Information Network of Australia (EMSINA), which is also another system of The Australian Emergency Management Committee, fulfills the duty of sharing risk and disaster data gained by the means of satellite (EMSINA, 2008). There are so many other systems formed in order to provide support for disaster management in Australia. However, in this country there are problems observed in other countries on the disaster systems' integration.

Today, various disaster informatics and archive systems which present national and international service have been formed in almost every country. For example, the

library of The Japan International Cooperation Agency (JIKA) has a disaster archive where data change and resource share are made on an international level. But there is no system which executes together with disaster management systems and shares real-timed data. Another system, which serves nationally in disaster management, is the Integrated Public Alert and Warning Systems (IPAWS) in the United States. IPAWS is a system which was founded in order to warn the public and concerned institutions about every kind of emergency by the means of telephones, televisions and computers. IPAWS serves as integrated with similar national systems such as Geo-targeted Alerting System (GTAS), Web Alert Relay Network (WARN), Digital Emergency Alert System (DEAS), Emergency Telephone Notification (ETN) and Deaf and Hard of Hearing Notification System (DHNS).

Disaster systems show a variety within themselves because of the disaster type, application area and user. For example, whereas measure of seismic data is important for the systems designed for earthquakes, observing air motions in the systems designed for the disasters like storm is important. Whereas the following of personal and social events in event management systems used by inner and outer security, the controlling and following of epidemics in health profile systems used by health organizations. Disasters classified as human-originated and natural, are also divided into different subtypes for their application area and research style. These differences, which also reflects the disaster system, obstruct the integrity of the mentioned systems. Common work processes, standard system and data models are needed in order to share every kind of disaster data obtained in different applications in a central disaster informatics and archive system. This purpose can be achieved by having institutional structuring, standard system, and common system and data models.

The table formed on disaster information share and disaster informatics systems in the world as following:

-- Disaster systems are formed according to a specific disaster area and integration with other systems are not seen as prior purpose.

-- For this reason, most of the disaster systems do not have common standards which can integrate with other systems.

-- There is a desire for the integration of the disaster systems, but the concrete studies on this field are not adequate.

-- In most of the disaster systems, common data models are not used.

-- The studies on collecting and sharing of disaster data in an archive making a central and real-timed archive are quite limited.

-- The studies on providing terminology unity and forming subject headings index in the disaster systems are inadequate.

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Disaster Management and Informatics Systems in Turkey

In Turkey, the management of disaster studies have still been executed by more than one institution. The public institutions which have first degree role and responsibilities in the execution of these studies are of the following: “Prime Ministry Crisis Management Center”, “Turkey Prime Ministry General Directorate of Emergency Management”, “The Ministry of Interior Civil Defence Organisation”, “The Ministry of Public Works and Settlement General Directorate of Disaster Affairs” and “Turkish Red Crescent” (Akça, 2007). This situation has frequently caused authority and responsibility confusion.

Disaster management is an application area which is executed by inter-disciplines cooperation. In the applications, in which inter-disciplines cooperation are made, the role of central structuring is very important. Central structuring is necessary for carrying on this kind of works from one center in coordination. Therefore, in Turkey important enterprises have been made in order to remove the negative effects of the scattered structure, the controlling and coordinating of disaster works in a center and also executing this activity in only one informatics system. For example, a law draft has been prepared for collecting the institutions which have first degree authority and responsibility in one center. In the draft, disaster management responsibility under the authority of various institutions is turned over to “Disaster and Emergency Management Presidency” which will be founded in the structure of Prime Ministry completely. Also in the presidency of Prime Ministry, a High Committee of Disaster and Emergency are being formed in the structures of Ministries of National Defense, Internal Affairs, Foreign Affairs, Finance, Health, Transportation, Public Affairs and Settlement and Environment and Forest. To the mentioned committee is given the responsibility of forming the national disaster policy and realizing it.

Assignment of various institutions serving under the different ministries and institutions in Turkey to Disaster and Emergency Management Presidency which will be founded in the structure of Prime Ministry, is a positive development on this matter. The studies, which have been carried as scattered on this field in Turkey until today, will be under control in a short time. However, a national disaster management center is necessary for managing national disaster data in only one center and system. National disaster information center makes leadership of founding and operating national disaster informatics and archive system which can share real-timed data with every kind of disaster informatics system. In order to meet the deficit, two projects, named Disaster Information System and National Disaster Archive System, have been carried on by The Ministry of Public Works and Settlement General Directorate of Disaster Affairs for a long time. The purpose of a Disaster Information System is providing the integration of every kind of service and responsibility before and during a disaster. Analysis of the disaster risks of residential areas, preparing the risk map, providing coordination with local and central administrative units and recording the experienced disaster data are the basic targets of this project (Hamzaçebi, Koç, Velioğlu and Erdem, 2004, p. 1; Turkey, 2007).

The National Disaster Archive System was founded in 2007, but the system has not been started to be used since the transfer of databases has not finished yet. The purpose of this project is transferring the national disaster inventory and archive information to numerical mediums and presenting them to the service of the decision makers and science world (Afet, 2007). The natural disaster data in Turkey will light the future studies after both of the projects are finished. Another advantage of the projects is uniting all public institutions, which have roles and responsibilities for disasters, on the same system and presenting the collected disaster data to the use of all public institutions. However, these studies are only made for natural disasters. Therefore, there has not been a study carried on managing human-originated disasters on a central system in Turkey yet. Moreover, there is no study on the subject of integration of both systems with other systems. Furthermore, since the mentioned projects have not been finished yet, the deficiency in the archiving of the national disaster data has still been in effect.

Considering the studies carried on disaster management generally, it can be said that Turkey remains behind the developments in disaster management in the world. While collecting the responsibility of disaster management under a central administration is a positive sign, nothing has been done for the standardization of disaster systems until today. Because the national disaster archive resources have not been shared in a central system, the information resources of public institutions such as health problems, social events, landslides, earthquakes and floods are only presented to the service of their own institutions. Since not transferring the important part of the resources into numerical medium, informatics systems' not giving opportunity to data sharing, and data models', used in informatics systems, being incompatible with the common standards, the national disaster information resources have begun to be tacit information in Turkey.

Conclusion

Many disaster informatics systems have recently been formed in the world and Turkey. We can divide these systems into two as disaster informatics systems, which are directly formed for disaster management and the other systems providing data support to disaster informatics systems. Referring to the characteristics of the systems used today, it is seen that disaster informatics systems show differences according to the type of disaster. In other words, each disaster informatics system has differences with respect to the other systems. The other systems giving data support to the disaster informatics systems are the systems which are formed for a special purpose. For example, geographic information system, global positioning system, digital photogrammetry and incident management system are some of them.

The ability of collating and sharing risks and disaster data in the same structure of direct disaster informatics systems and the other systems giving data support to them necessitates dealing with these subjects with a systematic evaluation. Suitable and well-timed sharing of risk and disaster data among the concerned institutions can only

be possible with giving disaster management leadership, national and public disaster information centers and disaster informatics systems more appropriate and standard form. The principles, which should be taken into consideration and the steps that should be taken, can be listed as following:

-- National disaster coordination centers should be founded in order to organize private and/or governmental disaster institutions, which carry on business in local, regional or national levels, in only one place.

-- The legal regulations, which can assign the roles and responsibilities of the mentioned center, should be made in order for the national disaster coordination center to have the power of sanction on the other institutions.

-- A disaster information center should be founded in the structure of national disaster coordination center in order to provide the unity among the disaster information centers and determine the standards about disaster informatics system.

-- A central disaster archive system, which collects the data from every kind of disaster informatics system used in the country and presents them to usage, should be founded.

-- The mentioned system should obtain the data about every kind of disaster in a real-timed way and present them to the usage of other institutions.

-- Common minimum standards should be determined in order for electronic systems that all disaster organizations in the country have to share data and every system is restructured according to these standards.

The standards, which should be taken into consideration in every kind of disaster informatics system, are the following:

— The standard of disaster archive interface,
— Data and file standards,
— Sharing standards,
— Metadata standard,
— Terminology standard,
— Projection and retrieval standards and
— Backup and transfer standards.

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